We claim:

1. An MSW treatment vessel, comprising:

a generally cylindrical reaction vessel with a first end and a second end, with said reaction vessel configured for rotation;

a drive mechanism for causing rotation of the reaction vessel;

one or more support tracks and wheels to support said reaction vessel as it rotates;

at least one access opening in said reaction vessel, through which MSW may enter and/ or exit said reaction vessel;

a door assembly adjacent said access opening, for closing said access opening;

a door sealing system, configured so that said access opening door assembly may be positioned adjacent said access opening, said door sealing system can seal said door to said access opening; and

one or more flights of auger vanes on the interior wall of said reaction vessel, for moving said MSW from said first end to said second end of said reaction vessel, and from said second end to said first end of said reaction vessel, with the auger vanes having a base edge attached to a interior vessel wall, and a top edge, with said top edges of said auger vanes defining a bore parallel the long axis of the reaction vessel, said bore having a diameter measuring approximately one third of the diameter of the reaction vessel at a corresponding point.

2. The MSW treatment vessel of claim 1, which further comprises a plurality of raised projections on the top edges of said auger vanes, to aid in moving and shredding MSW.

3. The MSW treatment vessel of claim 2 in which said raised projections are generally trapezoidal is shaped in configuration, and has one edge attached to the auger vane top edge, thus having a point of the triangle projecting away from the top edge of the auger vane.

4. The MSW treatment vessel of claim 2 in which said raised projections are oriented in a plane generally normal to the plane of said auger vane.

5. The MSW treatment vessel of claim 4 in which said raised projections include projections pointing in both directions from an attachment point on said auger vane top edge, and generally normal to the plane of the auger vane.

6. The MSW treatment vessel of claim 3, in which said auger vanes are positioned in a first section adjacent said access opening, a third section adjacent an end of said vessel opposite said access opening, and a second section positioned between said first and said third section.

7. The MSW treatment vessel of claim 6 in which said projections are located on said auger vanes in said third section.

8. The MSW treatment vessel of claim 7 in which said projections are located in said auger vanes in the third and the second section.

9. The MSW treatment vessel of claim 1 in which the height of said auger vanes tapers to near zero height in the first section of the vessel adjacent the access opening.

10. The MSW treatment vessel of claim 1 which further includes a rotary manifold for steam injection while said vessel is rotating.

11. The MSW treatment vessel of claim 1 which further includes an effluents condensation system comprising a steam eductor and a barometric condensing chamber.

12. The MSW treatment vessel of claim 1 which further includes swing away door assembly adjacent said access opening, with said door assembly comprising:

a swing away access opening door;

a davit assembly for supporting said swing away door, said davit assembly comprising a generally vertical davit upright, which supports and is rotatably connected to a generally horizontal door support arm, said support arm having a first end and a second end, said first end having a counterweight, and said second end being attached to said access opening door; wherein

said davit assembly is configured to rotate about said davit upright, so that said access opening door may be rotated away from or toward said access opening.

13. The MSW treatment vessel of claim 1 which further includes one or more chain sections attached to said vessel, so that when said vessel rotates, said one or more chains agitate and pulverize said MSW.

14. The MSW treatment vessel of claim 1 which is configured to rotate in one direction to load and pulverize MSW and is reversible to rotate in an opposite direction to unload and further pulverize said MSW.

15. The MSW treatment vessel of claim 10 in which said door sealing system comprises a first locking rim surrounding said access opening on the reactor vessel; an access opening door with a second locking rim, for placement adjacent the first locking rim, and a clamp collar for sealing the locking rims together, thus holding the access opening door over the access opening.

16. The MSW treatment vessel of claim 13, in which said clamp collar further comprises a first section and a second section, and one or more joining devices for joining the first section with the second section.

17. The MSW treatment vessel of claim 14, in which the joining device is one or more clamp screws which draw the first and second sections together, and hold them together until released.

18. The MSW treatment vessel of claim 15, which further comprises two clamp screws, which draw the first and second sections together at the ends of each section.

19. The MSW treatment vessel of claim 16, in which the two clamp screws are driven by one or more motors to open and close said clamp collar by moving said first and second sections of said clamp collar towards or away from each other.

20. A treatment vessel, comprising:

a generally cylindrical reaction vessel with a first end and a second end, with said reaction vessel configured for rotation;

a drive mechanism for causing rotation of the reaction vessel;

at least one access opening in said reaction vessel, through which product may enter and/ or exit said reaction vessel;

one or more flights of auger vanes on the interior wall of said reaction vessel, for moving product in said reaction vessel, with the auger vanes having a base edge attached to a interior vessel wall, and a top edge;

a self aligning door sealing assembly, comprising:

a swing away access opening door;

a first locking rim surrounding said access opening on the reactor vessel;

an access opening door with a second locking rim, for placement adjacent the first locking rim; and

a clamp collar for drawing said locking rims together, and for sealing the locking rims together, thus sealing said access opening door over the access opening.

21. The treatment vessel of claim 18, which further comprises a davit assembly for supporting said swing away door, said davit assembly comprising a generally vertical davit upright, which supports and is rotatably connected to a generally horizontal door support arm, said support arm having a first end and a second end, said first end having a counterweight, and said second end being attached to said access opening door;

wherein said davit assembly is configured to rotate about said davit upright, so that said access opening door may be rotated away from or toward said access opening, and when adjacent said access opening, said door sealing system can seal said door to said access opening.

22. The MSW treatment vessel of claim 18, in which said clamp collar further comprises a first section and a second section, and one or more joining devices for joining the first section with the second section.

23. The MSW treatment vessel of claim 20, in which the joining device is one or more clamp screws which draw the first and second sections together, and hold them together until released.

24. The MSW treatment vessel of claim 21, which further comprises two clamp screws, which draw the first and second sections together at the ends of each section.

25. The MSW treatment vessel of claim 22, in which the two clamp screws are driven by one or more motors to open and close said clamp collar by moving said first and second sections of said clamp collar towards or away from each other.

26. The MSW treatment vessel of claim 18, in which said first locking rim and said second locking rim each further comprise a bevel edge on a side opposite a contact side of each, and said clamp collar comprises two matching bevel surfaces which guide and force said locking rims into alignment and pressure tight engagement.

27. An MSW treatment vessel, comprising:

a generally cylindrical reaction vessel with a first end and a second end, with said reaction vessel configured for rotation;

a drive mechanism for causing rotation of the reaction vessel;

at least one access opening in said reaction vessel, through which MSW may enter and/ or exit said reaction vessel;

a door assembly adjacent said access opening, for closing said access opening;

a door sealing system;

one or more flights of auger vanes on the interior wall of said reaction vessel, for moving said MSW inside said reaction vessel, with the auger vanes having a base edge attached to a interior vessel wall, and a top edge;

a plurality of raised projections on the top edges of said auger vanes, to aid in moving and shredding MSW.

28. The MSW treatment vessel of claim 25 in which said raised projections are generally trapezoidal is shaped in configuration, and has one edge attached to the auger vane top edge, thus having a point of the triangle projecting away from the top edge of the auger vane.

29. The MSW treatment vessel of claim 26 in which said raised projections are oriented in a plane generally normal to the plane of said auger vane.

30. The MSW treatment vessel of claim 27 in which said raised projections include projections pointing in both directions from an attachment point on said auger vane top edge, and generally normal to the plane of the auger vane.

31. A treatment vessel, comprising:

a generally cylindrical reaction vessel with a first end and a second end, with said reaction vessel configured for rotation;

a drive mechanism for causing rotation of the reaction vessel;

at least one access opening in said reaction vessel, through which product may enter and/ or exit said reaction vessel;

one or more flights of auger vanes on the interior wall of said reaction vessel, for moving product in said reaction vessel, with the auger vanes having a base edge attached to a interior vessel wall, and a top edge;

a door sealing assembly, comprising a swing away access opening door;

a davit assembly for supporting said swing away door, said davit assembly comprising a generally vertical davit upright, which supports and is rotatably connected to a generally horizontal door support arm, said support arm having a first end and a second end, said first end having a counterweight, and said second end being attached to said access opening door; wherein

said davit assembly is configured to rotate about said davit upright, so that said access opening door may be rotated away from or toward said access opening, and when adjacent said access opening, said door sealing system can seal said door to said access opening.

32. The MSW treatment vessel of claim 29, in which said door sealing assembly further comprises:

a first locking rim surrounding said access opening on the reactor vessel;

an access opening door with a second locking rim, for placement adjacent the first locking rim; and

a clamp collar for drawing said locking rims together, and for sealing the locking rims together, thus sealing said access opening door over the access opening.

33. The MSW treatment vessel of claim 30, in which said clamp collar further comprises a first section and a second section, and one or more joining devices for joining the first section with the second section.

34. The MSW treatment vessel of claim 31, in which the joining device is one or more clamp screws which draw the first and second sections together, and hold them together until released.

35. The MSW treatment vessel of claim 32, which further comprises two clamp screws, which draw the first and second sections together at the ends of each section.

36. The MSW treatment vessel of claim 33, in which the two clamp screws are driven by one or more motors to open and close said clamp collar by moving said first and second sections of said clamp collar towards or away from each other.

37. The MSW treatment vessel of claim 30, in which said first locking rim and said second locking rim each further comprise a bevel edge on a side opposite a contact side of each, and said clamp collar comprises two matching bevel surfaces which guide and force said locking rims into alignment and pressure tight engagement.

38. A method for treating MSW for fiber recovery, which comprises the steps of:

putting MSW in a generally cylindrical reaction vessel, in which the vessel has internal auger vanes for moving and mixing the MSW, with the diameter of the vane edges being 1/3 less than the diameter of the corresponding vessel wall;

closing the reaction vessel using a motorized screw operated clamp that seals a door cover to an access opening;

rotating the vessel while adding steam at 15 pounds or less through sparging lines in said vessel;

rotating the vessel and heating the MSW for approximately 15 or more minutes while injecting steam through the sparging lines;

evacuating the steam and internal atmosphere through a barometric condenser before removing the treated MSW, to reduce escaping emissions;

opening the door cover, and removing the treated MSW by rotation of the vessel and by action of the auger vanes.

39. The MSW treatment vessel of claim 1 in which said auger vanes are attached to said interior vessel wall by attachment to brackets attached to said interior vessel walls.